Table 13.9. (cont.) *Seasonally adjusted areal reduction factors for the Southeast region.*						
Offset 4 Months						
Area (mi²)	**1 hr**	**6 hr**	**12 hr**	**24 hr**	**48 hr**	**72 hr**
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.952	0.964	0.967	0.972	0.986	0.994
100	0.917	0.926	0.932	0.951	0.965	0.976
200	0.879	0.896	0.898	0.927	0.941	0.961
500	0.838	0.849	0.859	0.893	0.916	0.939
1000	0.791	0.815	0.833	0.859	0.883	0.907
2000	0.719	0.750	0.783	0.794	0.815	0.829
5000	0.543	0.618	0.664	0.680	0.711	0.743
10000	0.376	0.484	0.562	0.585	0.612	0.634
Offset 5 Months						
Area (mi²)	**1 hr**	**6 hr**	**12 hr**	**24 hr**	**48 hr**	**72 hr**
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.968	0.974	0.977	0.981	0.986	0.990
100	0.938	0.941	0.952	0.968	0.981	0.993
200	0.910	0.916	0.923	0.951	0.964	0.984
500	0.876	0.880	0.894	0.924	0.948	0.971
1000	0.836	0.841	0.875	0.896	0.915	0.934
2000	0.776	0.781	0.820	0.825	0.841	0.855
5000	0.612	0.646	0.709	0.714	0.729	0.753
10000	0.432	0.526	0.608	0.622	0.639	0.662

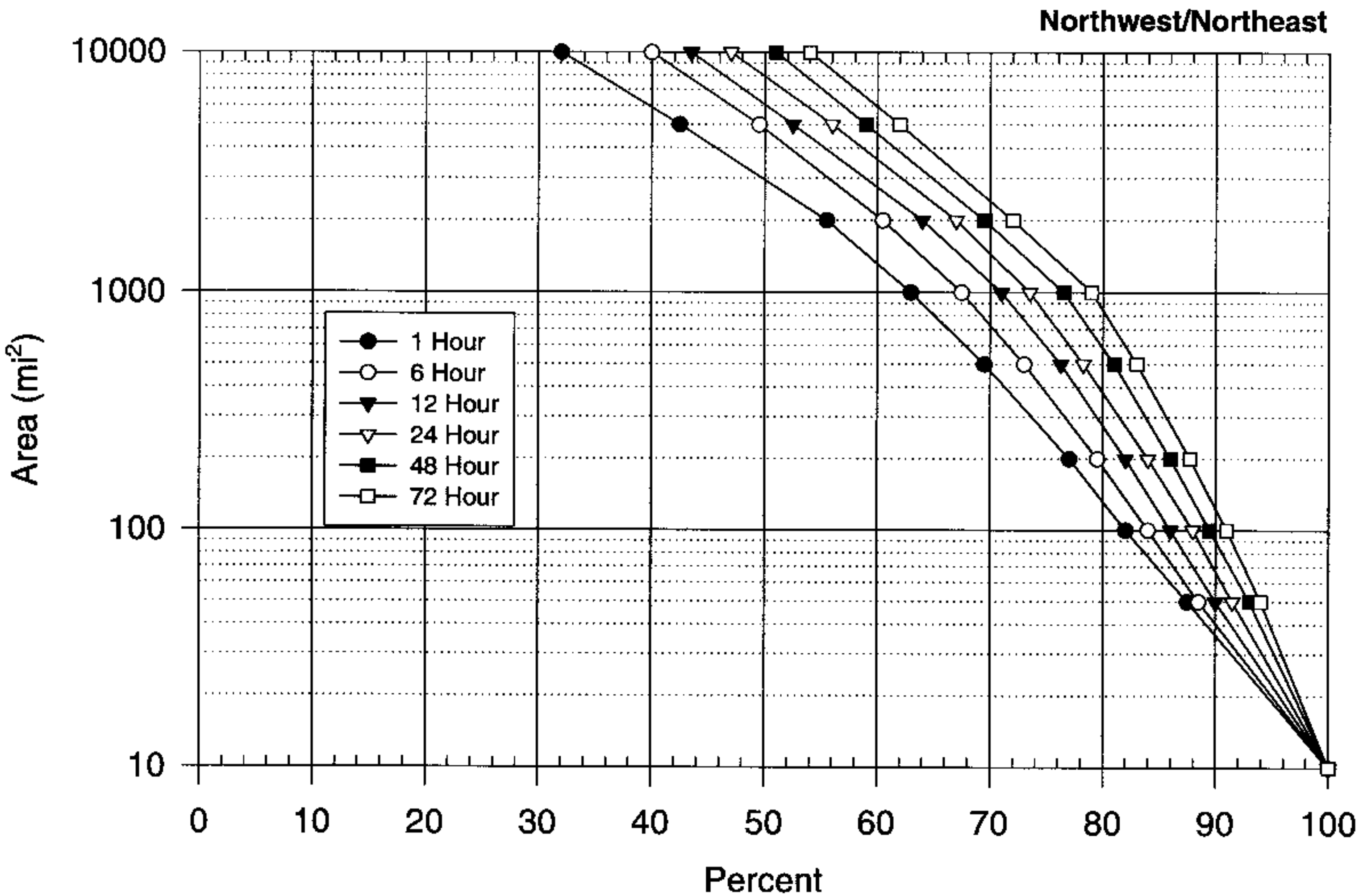

Figure 13.12. *Depth-area relations for the California Northwest/Northeast region for 1 to 72 hour durations. Same as Figure 8.1.*

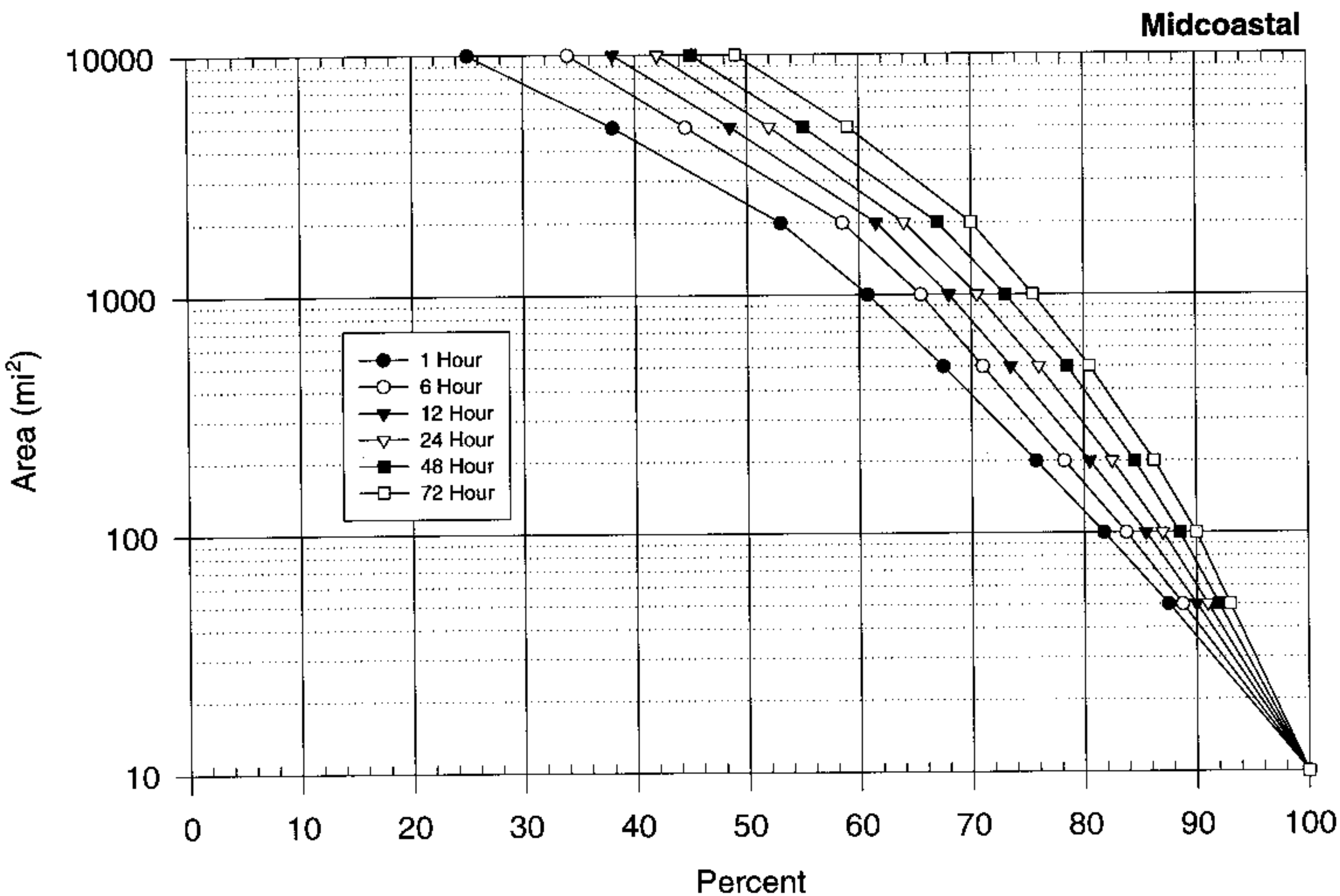

Figure 13.13. *Depth-area relations for the California Midcoastal region for 1 to 72 hour durations. Same as Figure 8.2.*

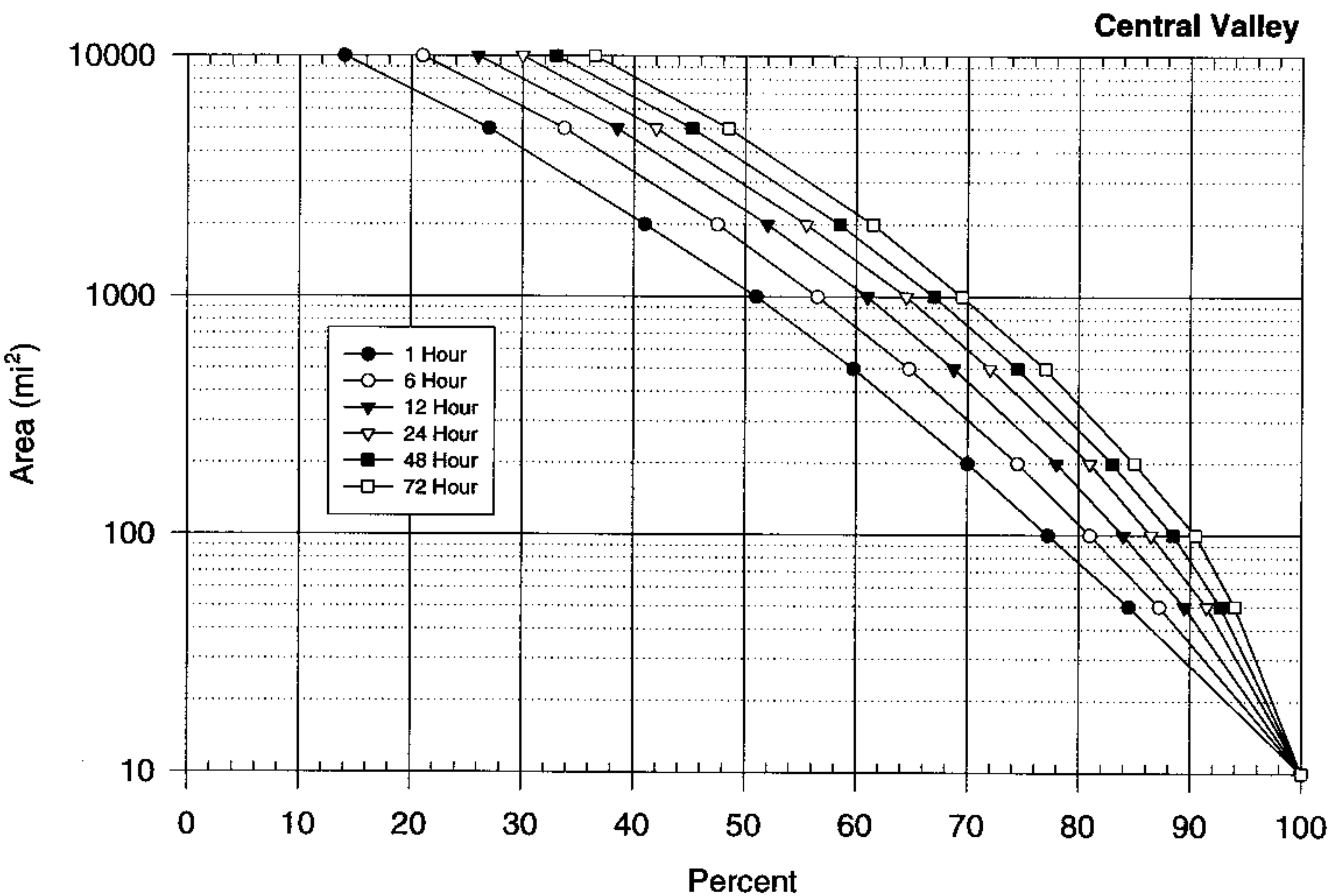

Figure 13.14. *Depth-area relations for the California Central Valley region for 1 to 72 hour durations. Same as Figure 8.3.*

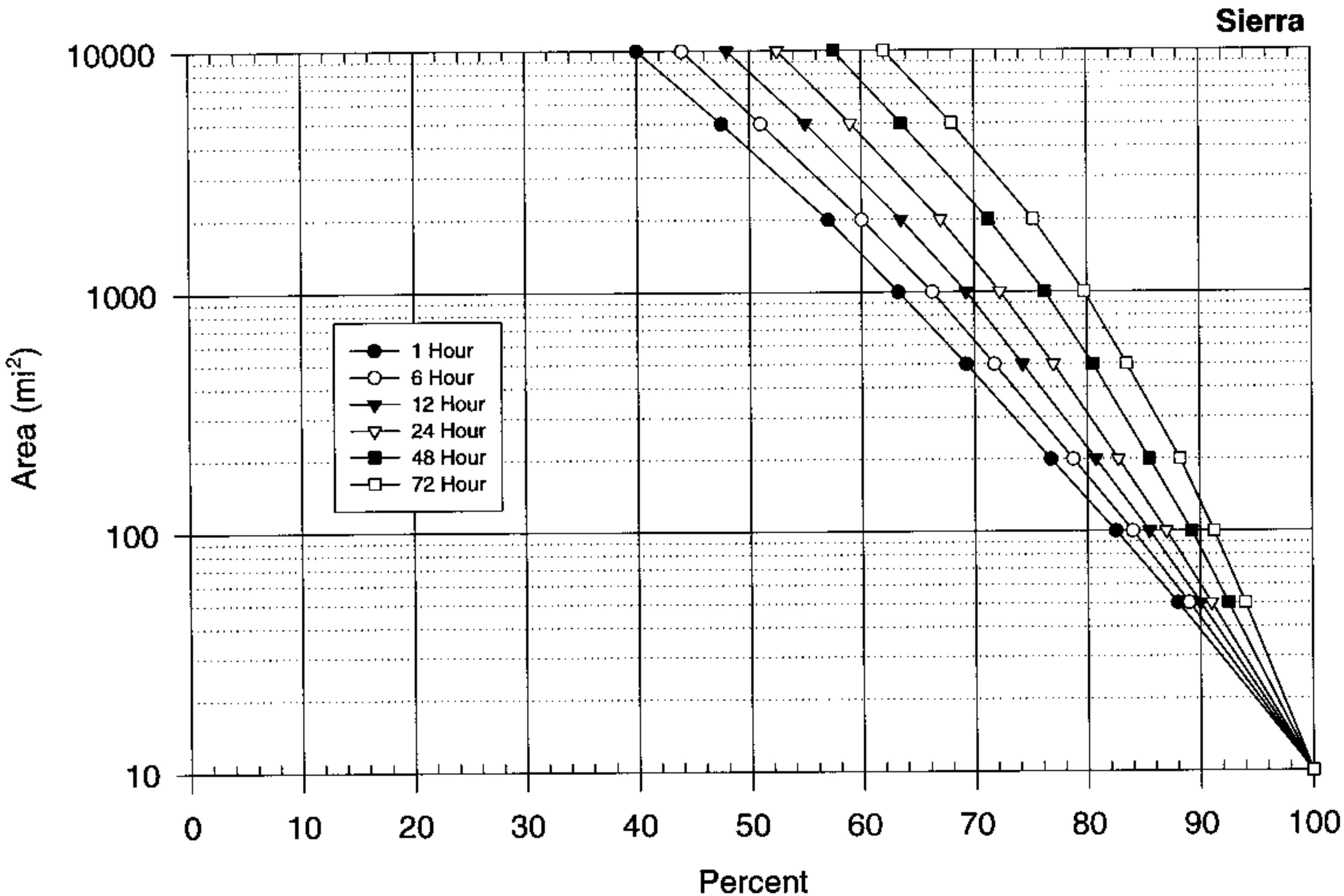

Figure 13.15. *Depth-area relations for the California Sierra region for 1 to 72 hour durations. Same as Figure 8.4.*

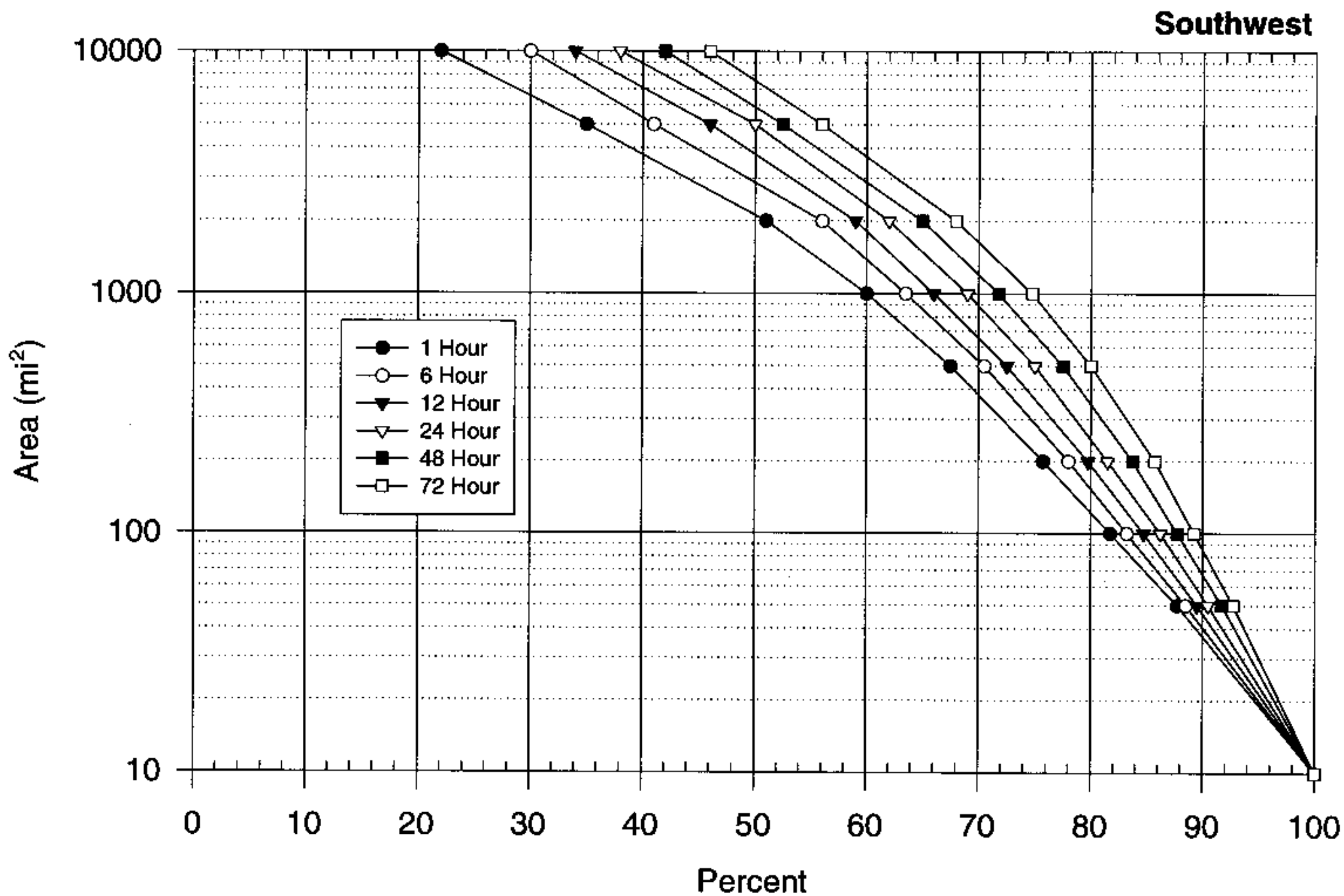

Figure 13.16. *Depth-area relations for the California Southwest region for 1 to 72 hour durations. Same as Figure 8.5.*

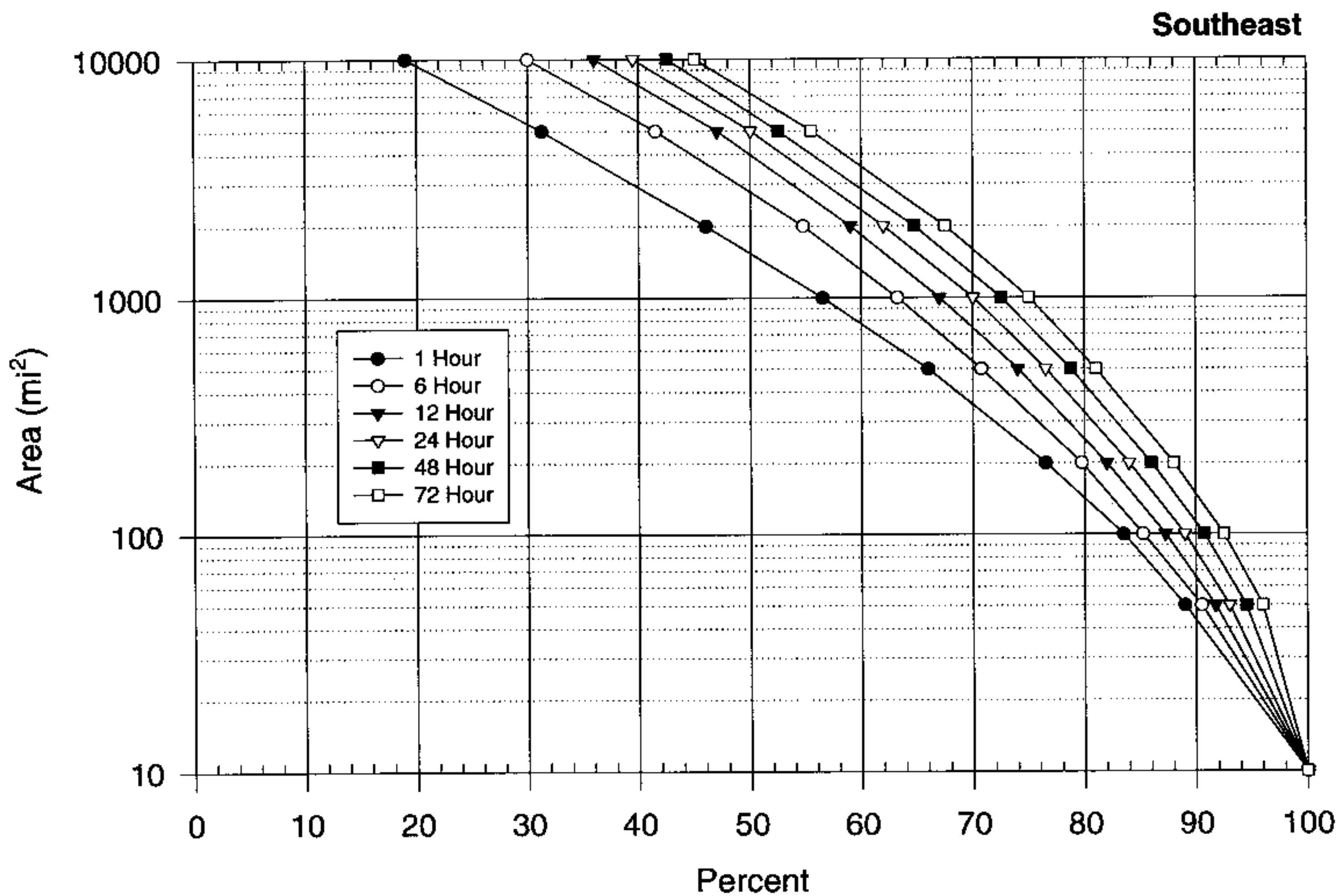

Figure 13.17. *Depth-area relations for the California Southeast region for 1 to 72 hour durations. Same as Figure 8.6.*

cumulative 6-hour values. A margin of plus or minus 0.5 inch is permissible in drawing this curve due to various roundings in Steps 1 to 6. Subtract each cumulative 6-hour depth from the depth of the next longer cumulative 6-hour duration. Some applications may require hourly increments. If this is the case, the smooth curve is subdivided into 72 cumulative hourly amounts and each cumulative hourly depth is subtracted from the depth at the next cumulative 1-hour longer duration.

8. Snowmelt parameters, temporal, and areal distributions.

During peer review a consensus recommendation was to include some procedures in the report to deal with these items. These items had not been within the scope originally formulated for the study. The snowmelt procedure from HMR 36 (1961) is incorporated in this report and found in Appendix 4.

Chronological partitioning of the PMP and its areal distribution were not studied in this report We would recommend that the user employ historical storms or divide the 72-hour PMP into 6-hour increments. Then arrange the final storm configuration into a front-, middle-, or end-loaded temporal distribution depending on the water management decisions that are required. One possible way of doing this is as follows:

A. For DAD regions 1-6 (Figure 13.11), group the four heaviest 6-hour values of the 72-hour PMP in a 24-hour sequence.

B. Within the maximum 24-hour period arrange the four 6-hour values as follows. Place the second highest 6-hour values next to the highest, the third highest on either side of the first two 6-hour values, and the fourth highest at either end.

C. The 24-hour largest 6-hour values may be positioned anywhere in the 72-hour storm period. The remaining eight 6-hour amounts may be positioned anywhere else.

A hydrologist may experiment with different temporal sequences to uncover any factors that would make a particular sequence more critical than another for a basin of concern. Selection of a particular sequence for a basin is a decision for the user.

One way of distributing the storm spatially is by developing an isopercental analysis based on the 100-year precipitation frequency maps from NOAA Atlas 2 (1973). This approximation was used to develop the individual storm analyses for this study, and has been used on other occasions to represent storm distributions.

Another approximation can be made by using a significant storm with a sufficient number of observations to draw a storm pattern over the basin of interest. If such a storm has been observed, then the storm pattern can be used to define an isopercental analysis for the PMP distribution. However, only a few California storms have sufficient detail to define a storm pattern over the complex terrain.

13.3 Example of General-Storm PMP Computation

The 973-mi^2 Auburn drainage above Folsom Lake is used as an example for the general-storm PMP. The Auburn drainage is located in the Sierra subregion or region 5. In this example, we will use the steps of Section 13.2. First, we will calculate the all-season PMP for the drainage, and then the PMP for the *off-season* month of May.

All-Season Calculation

Step

1. Drainage Outline

   The Auburn drainage is outlined on a section of the 24-hour, general-storm PMP Index in Figure 13.18, at a scale of 1:1,000,000.

2. User Decision

   We will do an all-season PMP calculation.

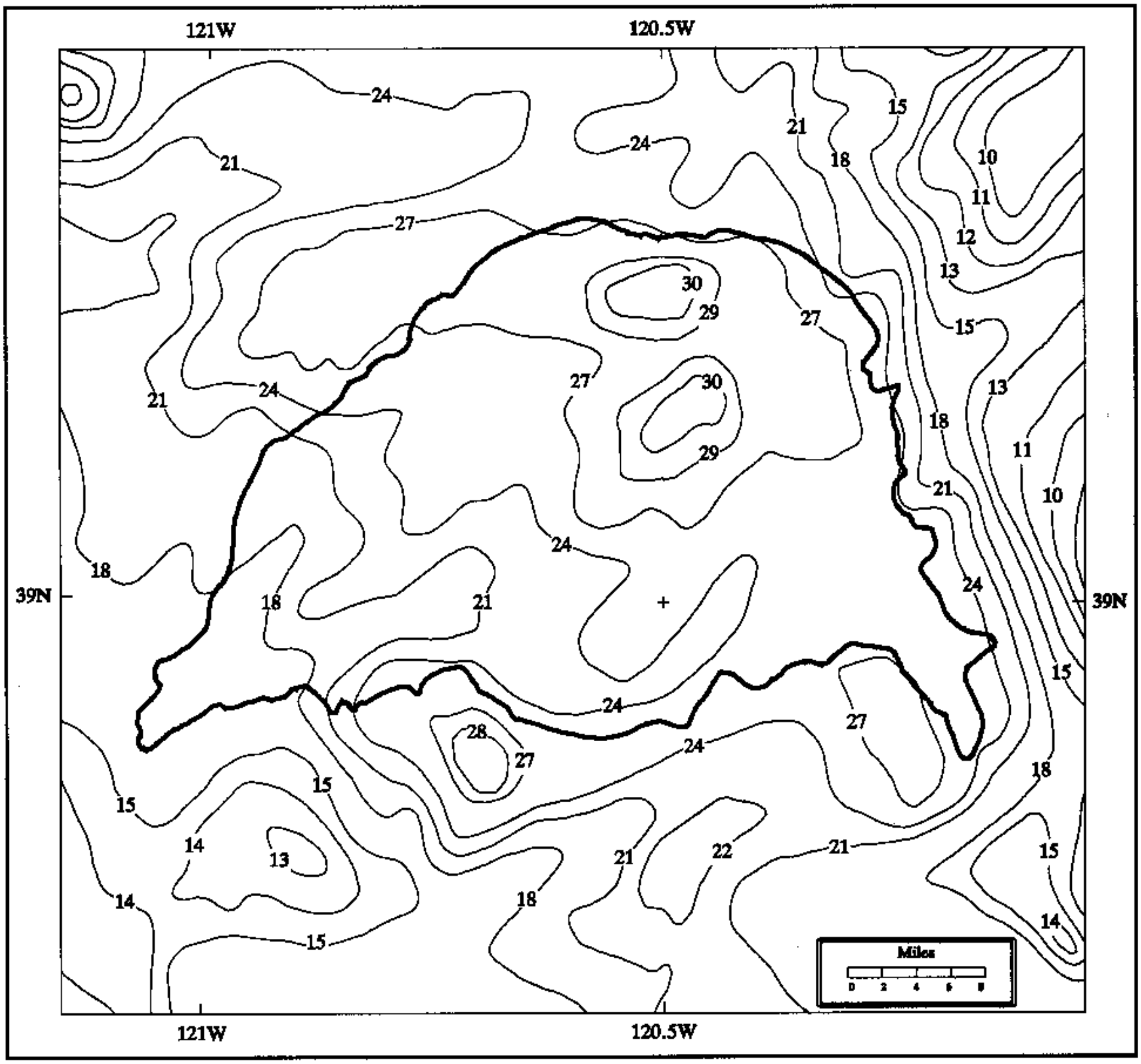

Figure 13.18. *Contours of general-storm index PMP in and around the 973-mi² Auburn drainage (heavy solid line) in California.*

3. All-Season Index PMP Estimate

Figure 13.18 shows the contours of index (10-mi^2, 24-hour) PMP superimposed on the outline of the Auburn drainage. It's average value is 24.6 inches.

4. Seasonal Index PMP Estimates

Skip this step.

5. Depth-Duration Relations

The Auburn drainage is within the Sierra classification (region 5) except for a very small portion near the dam site which may be regarded as inconsequential. Table 13.1 gives the ratios for durations from 1 hour to 72 hours.

Ratios for Auburn drainage						
	Duration (hours)					
	1	6	12	24	48	72
All-Season	.14	.42	.65	1.00	1.56	1.76

Multiply the result from Step 3, the average 10-mi^2, 24-hour PMP of 24.6 inches, by these ratios to produce the following 10-mi^2 depths of all-season PMP for Auburn:

Auburn drainage 10-mi^2 PMP						
	Duration (hours)					
	1	6	12	24	48	72
All-Season Depth (inches)	3.4	10.3	16.0	24.6	38.4	43.3

6. Areal Reduction Factors

Using the Auburn drainage area of 973 mi^2 and Figure 13.15, we get the following reduction ratios:

Reduction factors for Auburn drainage						
	Duration (hours)					
	1	6	12	24	48	72
All-Season	.64	.67	.70	.72	.77	.80

The depths from Step 5 are multiplied by these ratios to obtain the all-season, storm-centered average depths of PMP for the 973-mi^2 area of the Auburn drainage:

Auburn drainage average PMP depths						
	Duration (hours)					
	1	6	12	24	48	72
All-Season Depth (inches)	2.2	6.9	11.2	17.7	29.6	34.6

The results are plotted in Figure 13.19 as a solid line.

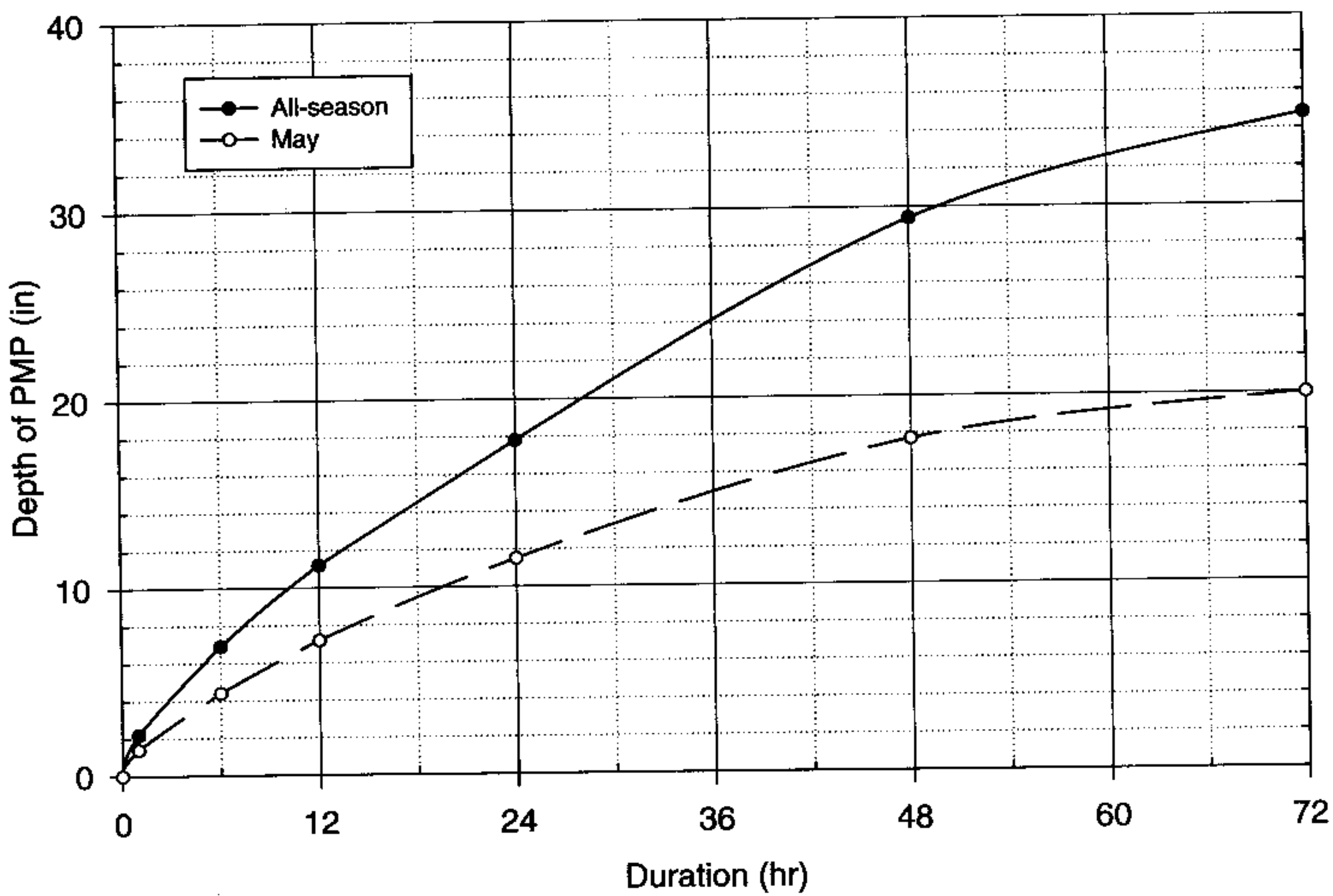

Figure 13.19. *Depth-duration curves for storm-centered, average depth of all-season (solid) and May (dotted) PMP for the 973-mi² Auburn drainage in California.*

7. Incremental Estimates

Cumulative depths at 6-hour increments, extracted from the curve of Figure 13.19 are:

6-hour cumulative depths												
Duration (hours)												
	6	12	18	24	30	36	42	48	54	60	66	72
All-Season PMP (inches)	6.9	11.2	14.6	17.7	20.8	23.8	26.7	29.6	31.6	32.7	33.7	34.6

The 6-hour incremental amounts are obtained by subtracting each (cumulative) durational amount from the next larger amount to get:

6-hour incremental depths												
Duration (hours)												
	6	12	18	24	30	36	42	48	54	60	66	72
All-Season PMP Increment (inches)	6.9	4.3	3.4	3.1	3.1	3.0	2.9	2.9	2.0	1.1	1.0	0.9

8. Temporal Distribution, Areal Distribution, and Snowmelt Parameters

Using the rules from Step 8 the twelve 6-hour increments from Step 7 could be distributed as following: 3.1, 3.0, 2.9, 2.9, 3.1, 4.3, 6.9, 3.4, 1.1, 0.9, 2.0, 1.0

The areal distribution can be found by following Step 8 in Section 13.2.

For snowmelt parameters see Appendix 4. A completed example for the all-season month of November may be found there.

Seasonal or Monthly PMP Calculation

<u>Step</u>

1. Drainage Outline

As with the all-season example, the outline of the drainage depicted nominally at a scale of 1:1,000,000 in Figure 13.18 is the of Auburn drainage.

2. User Decision

We will calculate seasonal PMP for the month of May.

3. All-Season Index PMP Estimate

Even though we are doing PMP for May which is not an all-season month, we need an all-season index value as a starting point. As with the previous all-season example, Figure 13.18 shows the average depth to be 24.6 inches.

4. Seasonal Index PMP estimates

Figure 13.4 shows the variation of general-storm PMP for the month of May as a percentage of all-season PMP (Plates 1 and 2). We determined an average value of 68 percent (to the nearest whole percent) for the Auburn drainage. This percentage was multiplied by the average depth from Step 3, and gives an average value of PMP of 16.7 inches for May. The nearest all-season month is March (Figure 13.2), and the monthly offset is 2.

5. Depth-Duration Relations

As indicated earlier, the Auburn drainage is within the Sierra classification (region 5) except for a very small portion near the dam site which is inconsequential. Table 13.2 shows that the seasonally adjusted 10-mi^2 depth-duration ratios for May or a two-month offset are:

Ratios for Auburn drainage						
	Duration (hours)					
	1	6	12	24	48	72
May	.148	.437	.663	1.00	1.451	1.549

The 10-mi^2 depth of May PMP is obtained by multiplying the average 24-hour, 10-mi^2 PMP for May (16.7 inches) at Auburn by ratios for 1 hour to 72 hours. These are shown below:

Auburn drainage 10-mi^2 PMP						
	Duration (hours)					
	1	6	12	24	48	72
May Depth (inches)	2.5	7.3	11.1	16.7	24.2	25.9

6. Areal Reduction Factors

Interpolating to 973 mi^2 from Table 13.7 (Sierra region, offset of 2), we obtain the following reduction ratios:

Reduction factors for Auburn drainage						
	Duration (hours)					
	1	6	12	24	48	72
May	.548	.607	.648	.687	.731	.773

Multiplying these ratios by the corresponding May PMP depths from Step 5 gives the following storm-centered average depths of PMP across the 973-mi^2 Auburn drainage for May:

Auburn average drainage (973-mi²) PMP depths						
Duration (hours)						
	1	6	12	24	48	72
May Depth (inches)	1.4	4.4	7.2	11.5	17.7	20.0

7. Incremental Estimates

The results from Step 6 are also plotted in Figure 13.19 and a curve (dotted line) is drawn for these results. Cumulative depths at 6-hour increments to the nearest tenth of an inch, extracted from the curves, are as follows:

6-hour cumulative depths												
Duration (hours)												
	6	12	18	24	30	36	42	48	54	60	66	72
May PMP (inches)	4.4	7.2	9.4	11.5	13.3	15.0	16.4	17.7	18.5	19.1	19.6	20.0

To obtain 6-hour PMP values, subtract each (cumulative) amount from the next larger amount to get:

6-hour incremental depths												
Duration (hours)												
	6	12	18	24	30	36	42	48	54	60	66	72
May PMP Increment (inches)	4.4	2.8	2.2	2.1	1.8	1.7	1.4	1.3	0.8	0.6	0 .5	0.4

8. Temporal Distribution, Areal Distribution, and Snowmelt Parameters

A possible temporal precipitation (inches) sequence for the twelve 6-hour increments in May is: 0.6, 0.8, 2.2, 4.4, 2.8, 2.1, 1.8, 1.7, 1.4, 1.3, 0.5, 0.4

This is a possible sequence from the guidelines mentioned is Step 8 of Section 13.2. The areal distribution of isohyets can be obtained using the guidance from Step 8 of Section 13.2. No snowmelt parameters are required for May, since they are only valid for October through April.

13.4 Local Storm Procedures

Two options are available for obtaining the local-storm PMP values. They are:

A. Obtain the average depth of PMP for a drainage without specifying its areal distribution, or

B. Specify the areal distribution of the precipitation from a PMP storm within a drainage.

Option A requires Steps 1-5 below; Option B requires that Steps 1 and 2 are used followed by Step 6. If Option B is selected, a drainage average depth of the isohyetal precipitation pattern for various PMP storm placements must be chosen. There will be as many average depths for the drainage as there are placements for the PMP storm. The average depths of precipitation in a drainage obtained from Option B will be less than the average depth of PMP from Option A unless the drainage has the exact boundary shape shown in Figure 13.20.

Step

1. One-hour, 1-mi^2 local-storm PMP

   Locate the basin on Figure 13.21 and determine the basin-average, 1-hour, 1-mi^2, local-storm index value of PMP. Use linear interpolation.

2. Adjustment for Mean Drainage Elevation

   Determine the mean elevation of the drainage. No adjustment is necessary for elevations of 6,000 feet or less. If the mean elevation is greater than 6,000 feet,

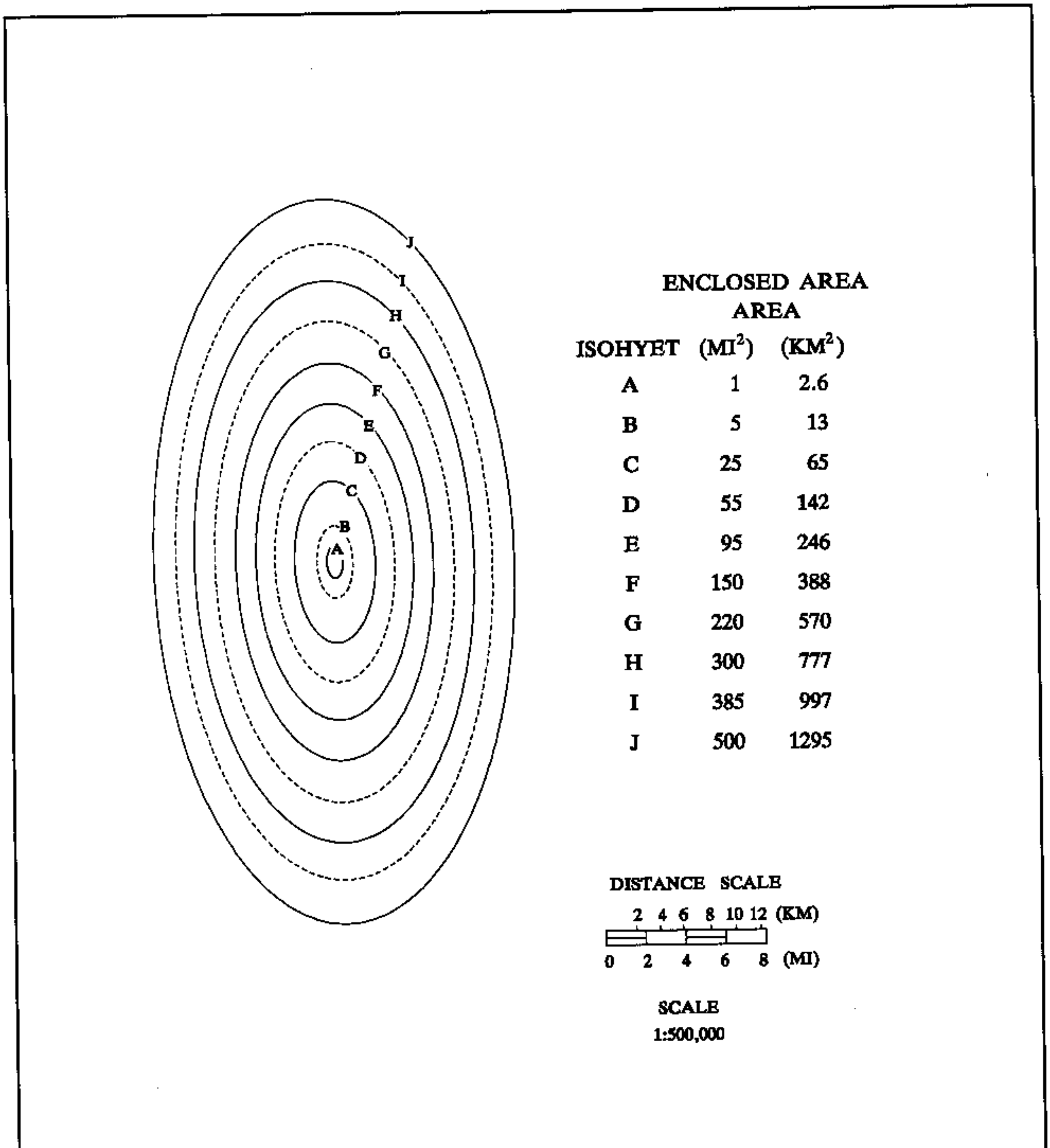

Figure 13.20. *Idealized isohyetal pattern for local-storm PMP areas up to 500 mi^2. Same as Figure 9.18.*

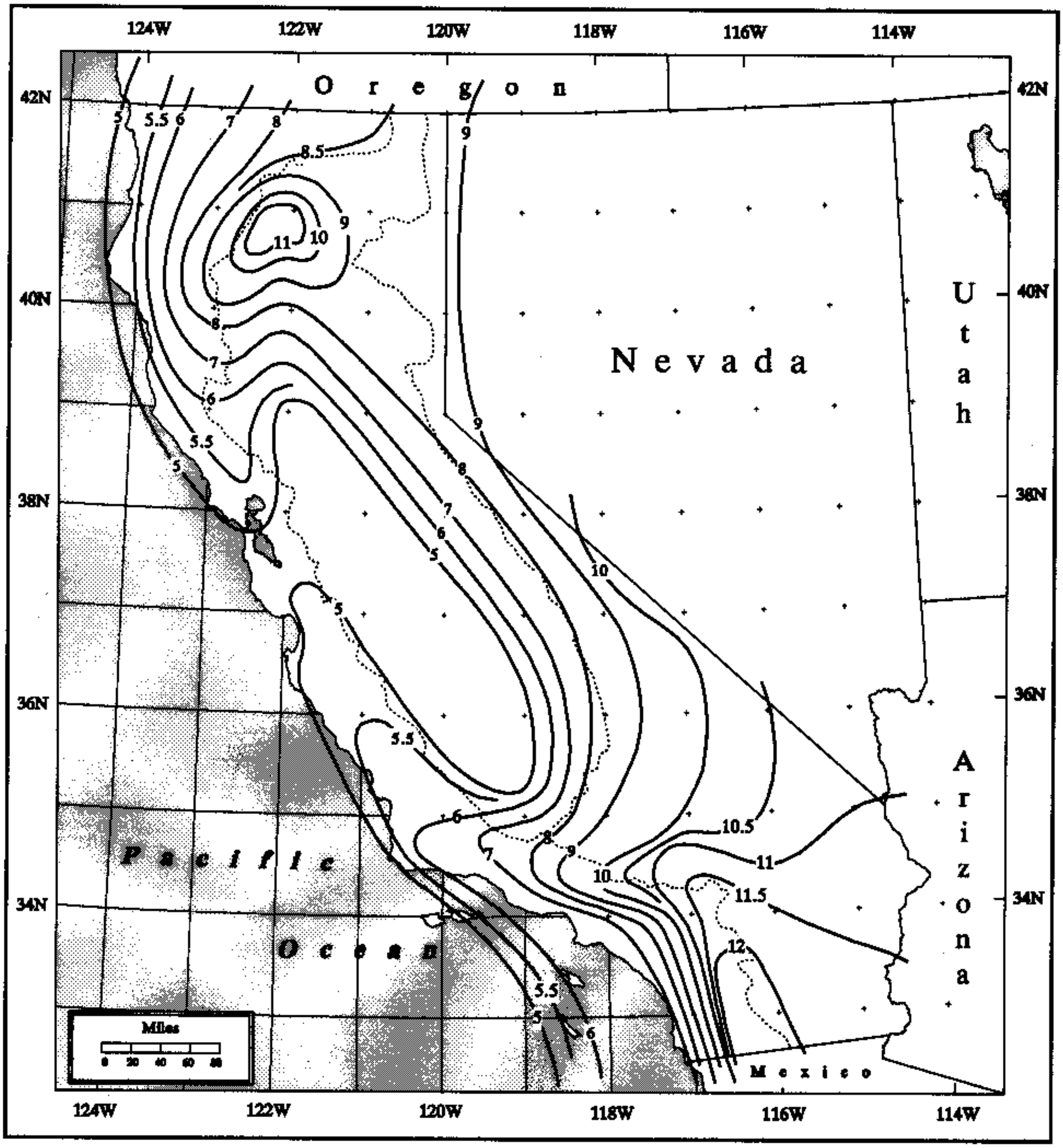

Figure 13.21. *California local-storm PMP precipitation estimates for 1 mi², 1 hour (inches). Dashed lines are drainage divides. Same as Figure 9.23.*

reduce the PMP from Step 1 by 9 percent for every 1,000 feet above the 6,000-foot level. Figure 13.22 can be used to graphically determine this value.

As an example of the elevation adjustment let us assume we have a basin with a mean elevation of 8,700 feet (2,700 feet above 6,000 feet). The reduction factor would be 24.3 percent (2.7 times .09), giving an elevation-adjusted PMP of 76 percent (rounded) of full 1-hour, 10-mi^2 PMP. Had Figure 13.22 been used, a value of about 76 percent is read off the line labeled pseudo-adiabat for an elevation of 8,700 feet.

3. Adjustment for Duration

The 1-mi^2 local-storm PMP estimates for durations less than 1 hour are obtained from Figure 13.23, as a percentage of the 1-hour amount from Step 2. For durations greater than 1 hour, determine the location of the basin on Figure 13.24, which provides a 6-hour to 1-hour ratio of the local-storm PMP. Multiply this ratio by the 1-hour local-storm PMP to obtain the 6-hour local-storm PMP. The four multipliers on Figure 13.24 are defined as A (1.15), B (1.2), C (1.3), and D (1.4) and correspond to the A, B, C, and D of Figure 13.23. Local-storm PMP amounts for durations of 1 to 6 hours can be obtained from Figure 13.23 or Table 13.10 for specific durations.

4. Adjustment for Basin Area

Figures 13.25 to 13.28 give the area reductions to 500 mi^2 depending on the 6-hour depth-duration ratio used in Step 3. The reductions obtained for the selected durations and area of the basin then are multiplied respectively by the results from Step 3, and a smooth curve is drawn on graph paper for the plotted values to get estimates for durations not specified.

5. Temporal Distribution

Review of local-storm temporal distributions for this region show that most local storms have durations less than 6 hours and that the greatest 1-hour amount occurs

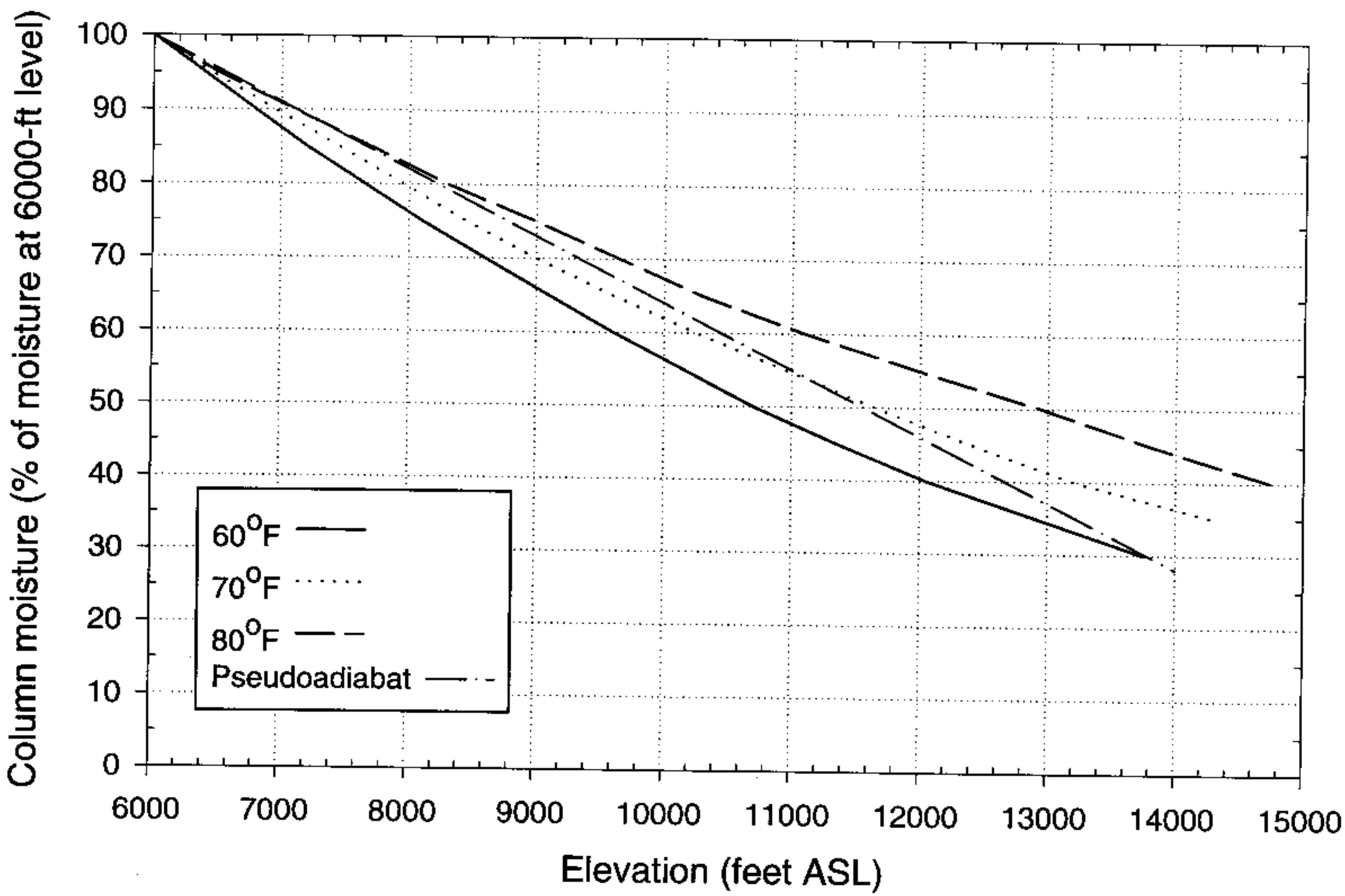

Figure 13.22. *Pseudoadiabatic decrease in column moisture for local-storm basin elevations.*

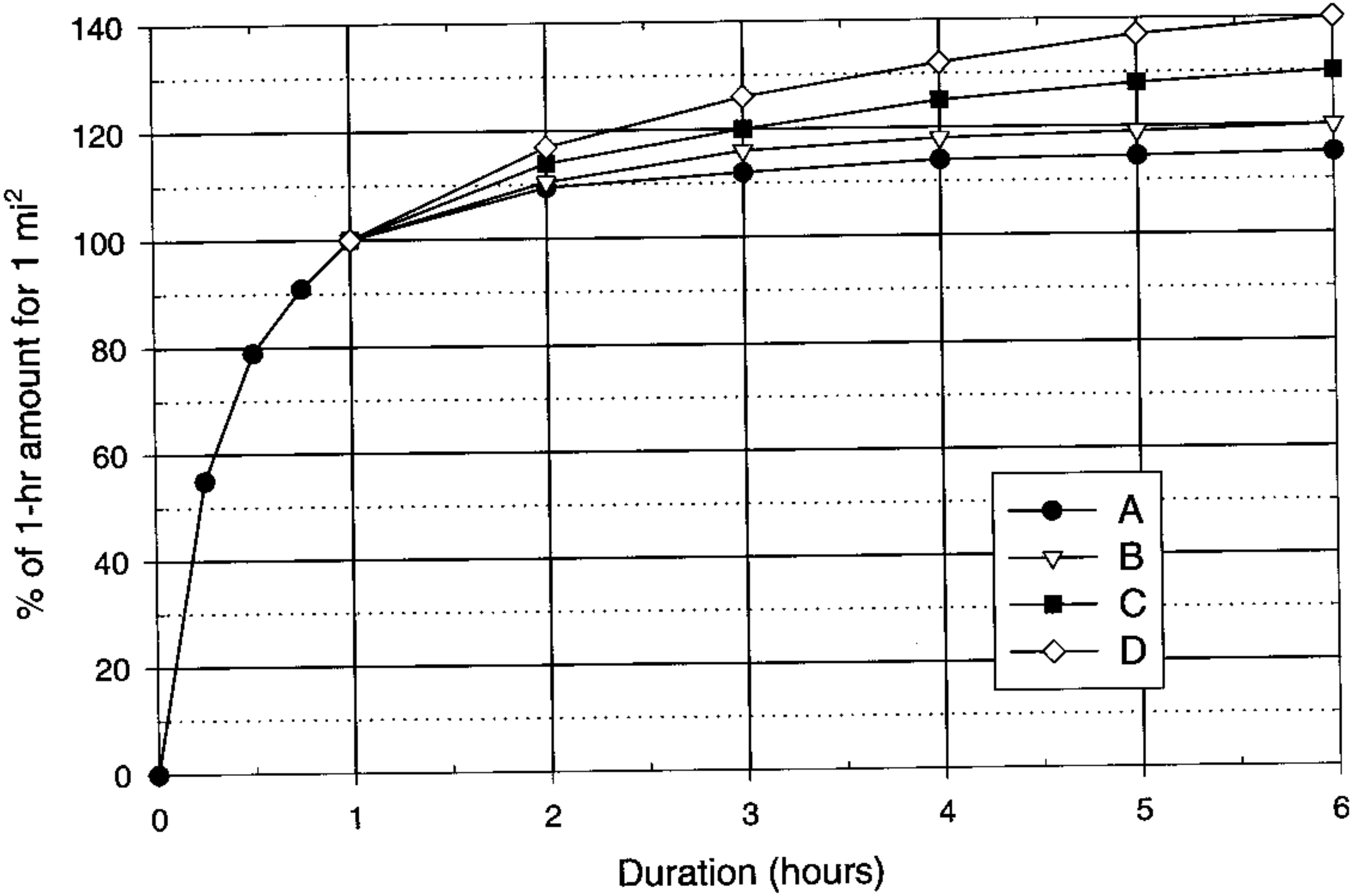

Figure 13.23. *Depth-duration relations for California for 6-hour to 1-hour ratios. The ratios are mapped in Figure 13.24; A = 1.15, B = 1.2, C = 1.3, D = 1.4. Same as Figure 9.17.*

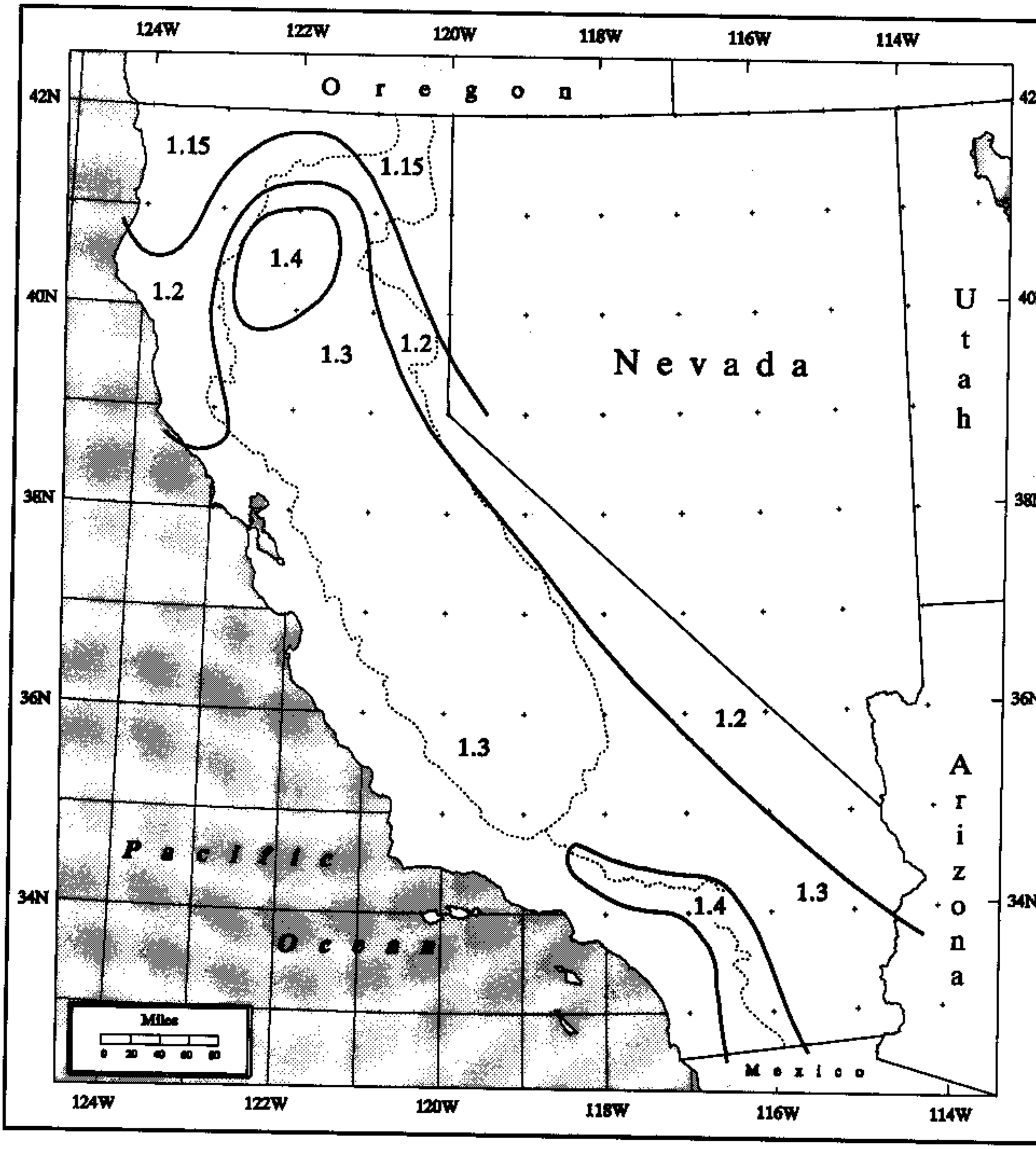

Figure 13.24. *California local-storm PMP 6-hour to 1-hour ratios for 1 mi². For use with Figure 13.23; A = 1.15, B = 1.2, C = 1.3, D = 1.4. Dashed lines are drainage divides. Same as Figure 9.16.*

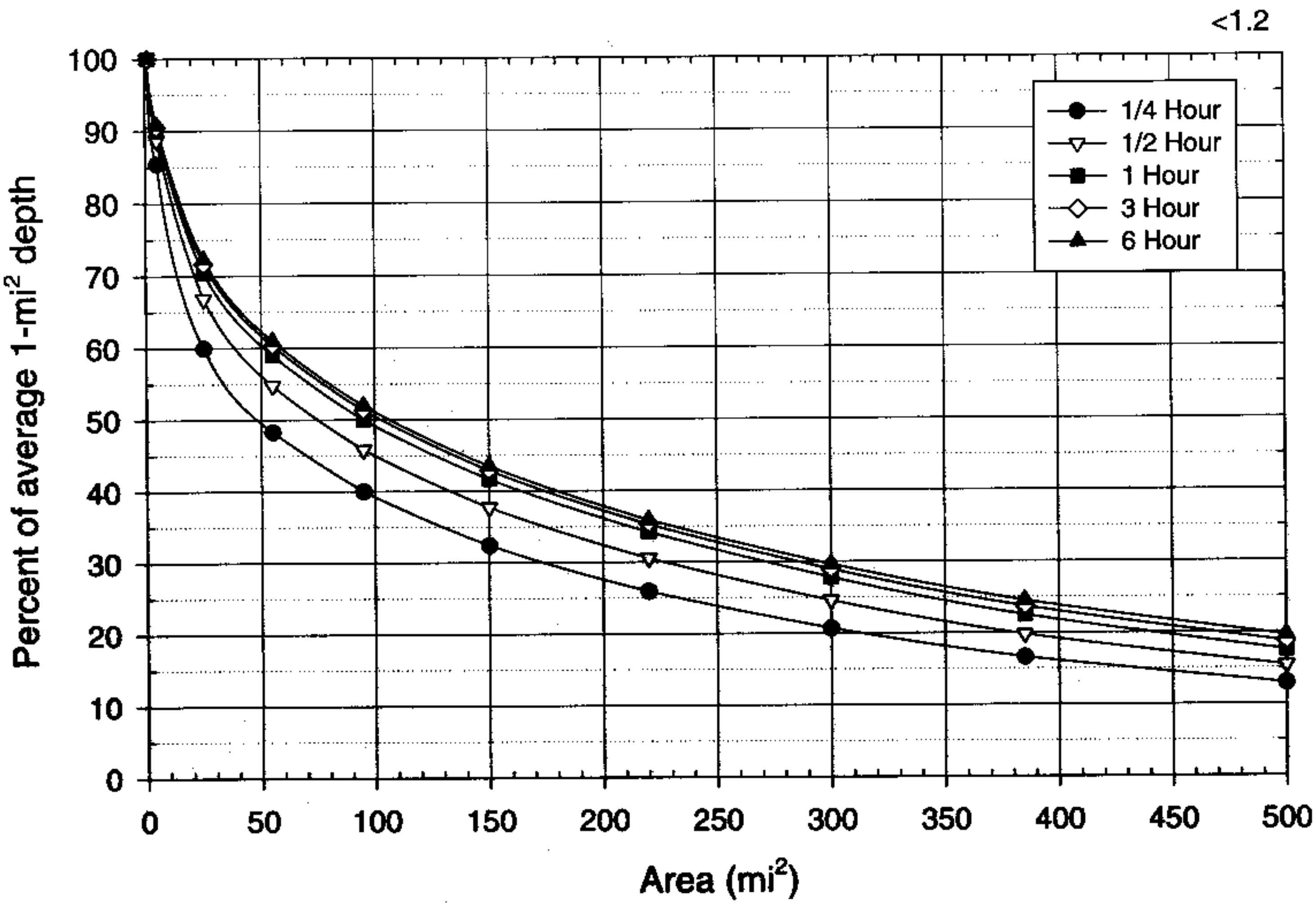

Figure 13.25. *Depth-area relations for California local-storm PMP for a 1-mi², 6-hour to 1-hour depth-duration ratio less than 1.2. Same as Figure 9.19.*

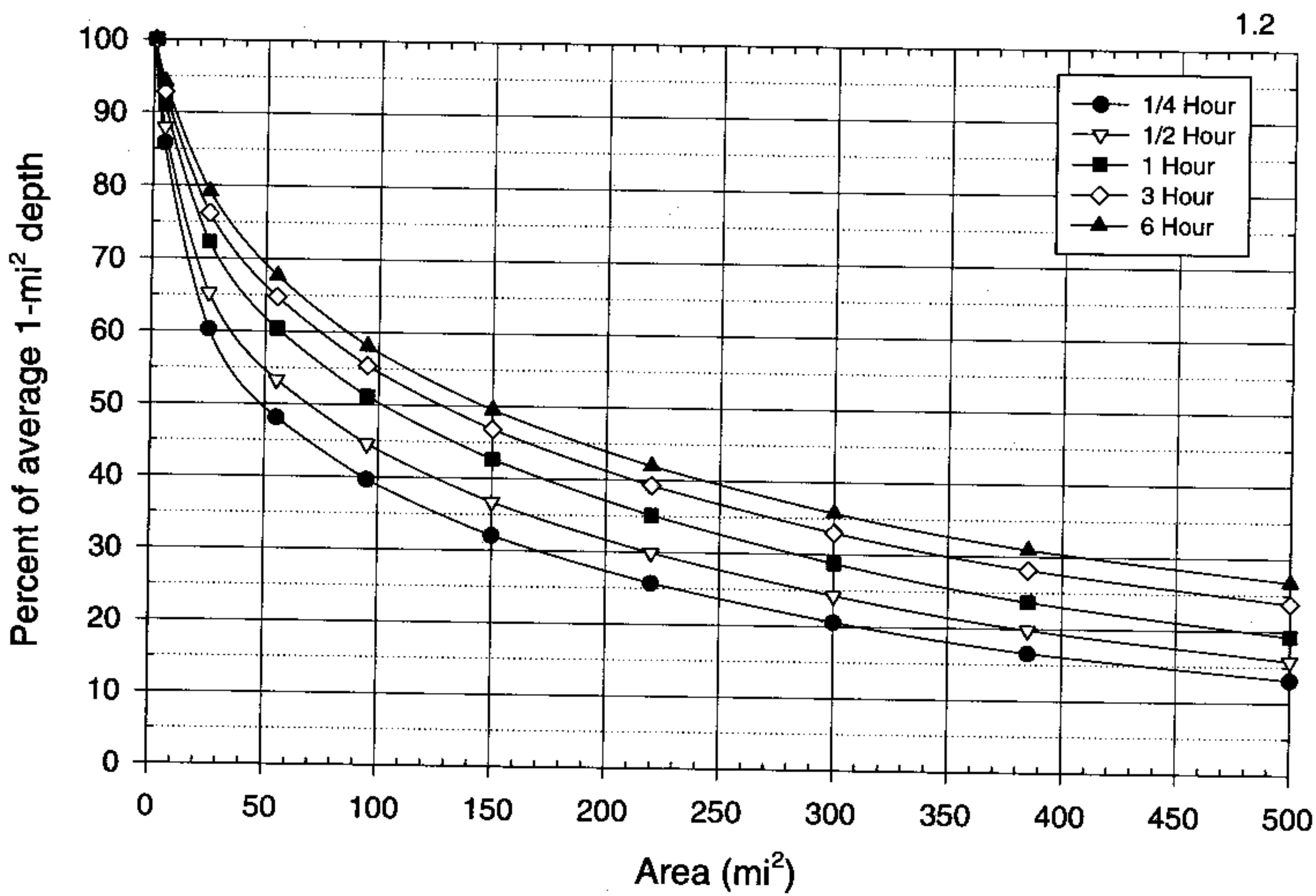

Figure 13.26. *Depth-area relations for California local-storm PMP for a 1-mi², 6-hour to 1-hour depth-duration ratio equal to 1.2. Same as Figure 9.20.*

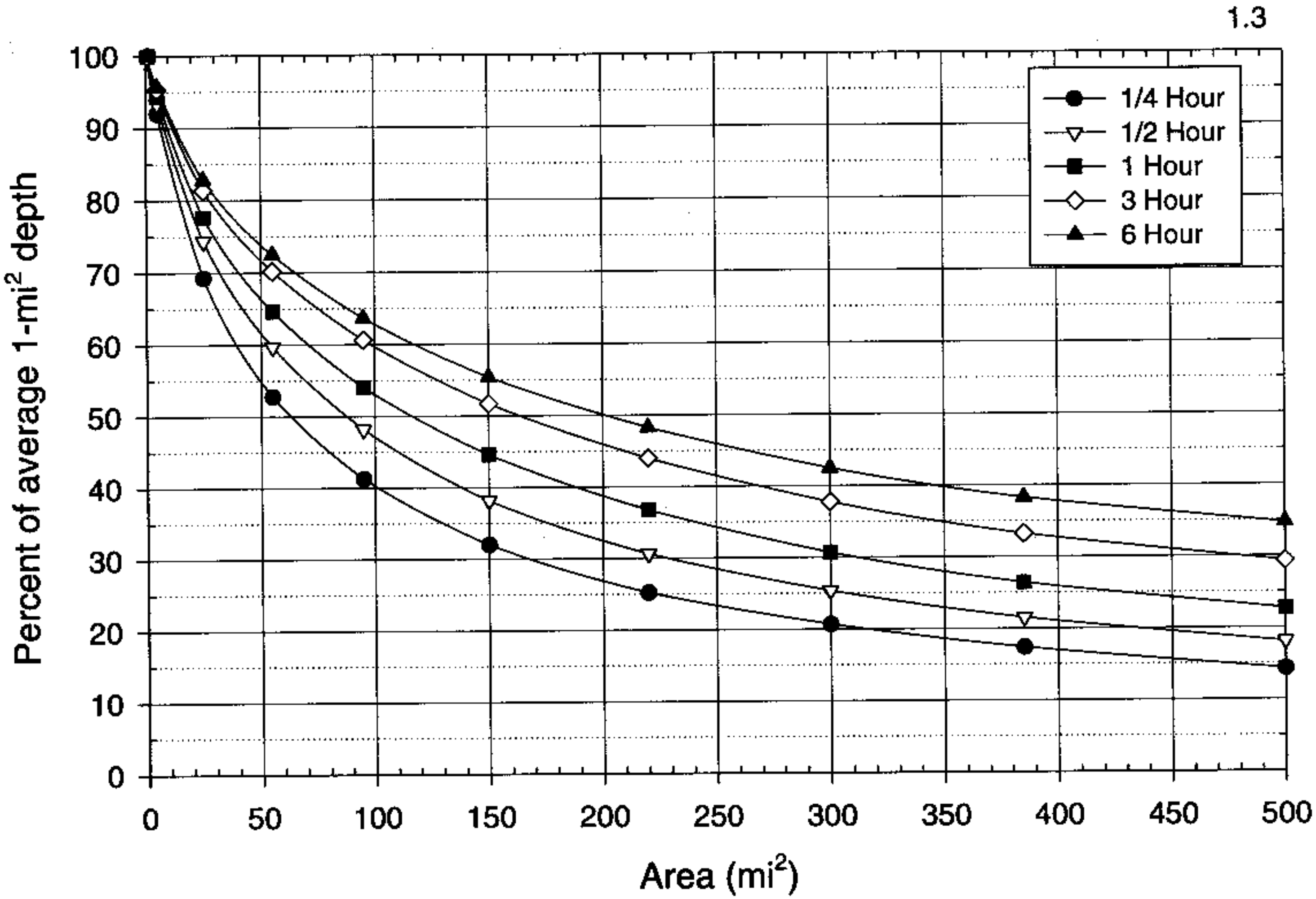

Figure 13.27. *Depth-area relations for California local-storm PMP for a 1-mi², 6-hour to 1-hour depth-duration ratio equal to 1.3. Same as Figure 9.21.*

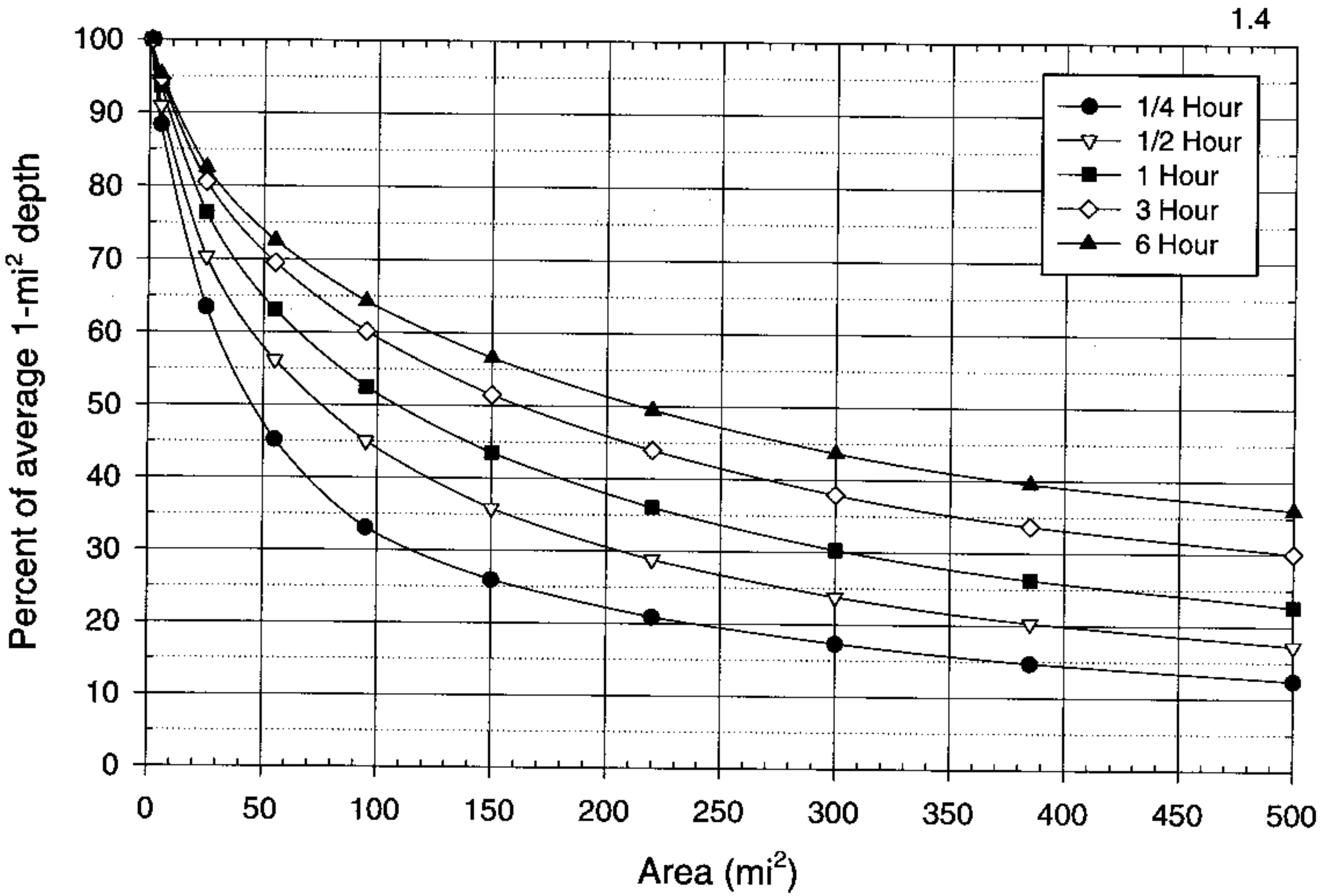

Figure 13.28. *Depth-area relations for California local-storm PMP for a 1-mi², 6-hour to 1-hour depth-duration ratio equal to 1.4. Same as Figure 9.22.*

in the first hour. The recommended sequence of hourly increments is as follows: arrange the hourly increments from largest to smallest as obtained directly by successive subtraction of values read from the smoothed depth-duration curve. The most intense 1-hour of precipitation occurs in the first hour of the storm, the second most intense hour in the second hour, and so forth.

Table 13.10.
Depth-duration relations (percent of 1-hour amount) for 1-mi² PMP for California local storms.

	Relationship Designator (see Figure 13.23)			
Duration (hours)	A	B	C	D
0	0	0	0	0
1/4	55	55	55	55
1/2	79	79	79	79
3/4	91	91	91	91
1	100	100	100	100
2	109.5	110.5	114	117
3	112	116	120	126
4	114	118	125	132
5	114.5	119	128	137
6	115	120	130	140

6. Areal Distribution for Local-Storm PMP

The elliptical pattern in Figure 13.20 and the tabulated percentages in Tables 13.11 to 13.14, are used to describe the areal distribution of precipitation of a local PMP storm. The 2:1 ratio of the major to minor axis of Figure 13.20 should be used or *placed* only on a map at a 1:500,000 scale. The average index value from Step 2 (or Step 1 if no elevation adjustment is made) is multiplied by each of the percentages from the appropriate table (Tables 13.11 to 13.14) to obtain the value for each

Table 13.11. *Isohyetal label values (percent of 1-hour, 1-mi² average depth) to be used in conjunction with isohyetal pattern of Figure 13.20 and basin-average depths from Figure 13.25.*

	Duration (hours)								
Isohyet	1/4	1/2	3/4	1	2	3	4	5	6
A	55	79	91	100	109.5	112	114	114.5	115
B	35	57	68	74.8	83.5	85.5	87.5	88	88.5
C	24	40	49	56	62.9	4.5	66	66.5	67
D	18.5	30.5	39	43	48	49.5	50.6	51.1	51.5
E	13	22.5	29	32.2	36.6	37.7	38.6	39	39.5
F	7.5	14.0	19	22.4	25	25.7	26.3	26.7	27.0
G	4.5	8.5	12	14.0	16.2	16.8	17.4	17.9	18.2
H	1.8	3.5	5	6.5	8.3	8.8	9.3	9.8	10.3
I	0.4	0.7	0.9	1.1	2.2	2.7	3.2	3.7	4.1
J	0.1	0.3	0.5	0.7	1.2	1.7	2.2	2.6	2.9

Table 13.12. *Isohyetal label values (percent of 1-hour, 1-mi² average depth) to be used in conjunction with the isohyetal pattern of Figure 13.20 and basin-average depths from Figure 13.26 .*

	Duration (hours)								
Isohyet	1/4	1/2	3/4	1	2	3	4	5	6
A	55	79	91	100	110.5	116	118	119	120
B	35.5	55	68	78	88	95	99	101	102.5
C	24	39	49	57	66	72	75	77	78.5
D	19	30	39	44	51.5	56	58.5	60	61
E	13.5	22	28	33	39	42.7	44.5	46	47
F	8.5	15	20	23	28	31.5	33.5	35	36
G	5.5	9.5	13	15	19	22	24	25	26
H	2	4.5	6.0	7.5	11.5	14.5	16.5	17.5	18.5
I	1	2	3	4	8	11	13	14.5	15.5
J	1	2	3	4	7	10	12	13.5	14.5

Table 13.13. *Isohyetal label values (percent of 1-hour, 1-mi² average depth) to be used in conjunction with the isohyetal pattern of Figure 13.20 and basin-average depths from Figure 13.27.*

	Duration (hours)								
Isohyet	1/4	1/2	3/4	1	2	3	4	5	6
A	55	79	91	100	114	120	125	128	130
B	44	66	77.6	86	100	106	111	114	116
C	26	44	53.6	61	74	81	86	89	91
D	17	31	40.2	46.5	58	65	70	73	75
E	11	20	26.8	32.5	42	49	54	57	59
F	6.6	13	19	24	32	38	43	46	48
G	6.5	11	14	16	23	28	33	36	38
H	5	8	10.5	12	17.5	21.5	25.5	29	31
I	3	6.0	8.5	10.5	16	20	24	27.5	30
J	2.5	5.5	8	10	15	19	23	26.5	29

Table 13.14. *Isohyetal label value (percent of 1-hour, 1-mi² average depth) to be used in conjunction with the isohyetal pattern of Figure 13.20 and basin-average depths from Figure 13.28.*

	Duration (hours)								
Isohyet	1/4	1/2	3/4	1	2	3	4	5	6
A	55	79	91	100	117	126	132	137	140
B	39	61	74	84	100	109	115	120	123
C	24	42	52	60	76	85	91	96	99
D	15	28	37	44	59	67	73	78	81
E	9	19	26	32	44	52	58	63	67
F	6	13.5	19	24	34	40	45	50	54
G	6	10	13.5	16	24	30	35	39	42
H	4	7	10	13	19	24	28	32	35.5
I	3.3	6.5	9	11	18	23	27	31	34.5
J	3	5.5	8	10	17	22	26	30	33.5

lettered isohyet (A - J). Once the labels have been determined for each application, the pattern can be moved to different placements on the basin. In most instances, the greatest volume of precipitation will be obtained when the pattern is centered in the drainage. However, peak flows may actually occur with placements closer to the drainage outlet. The basin-averaged depth of precipitation is obtained for chosen local PMP storm placements, by using planimetry, a GIS, or other area-averaging methods.

13.5 Example of Local-Storm PMP Calculation

We have selected a small area in southeastern California known as the McCoy Wash to illustrate the steps for calculating local-storm PMP. The Wash has an area size of 167 mi^2 and its boundary, along with selected contours of elevation, is shown in Figure 13.29. We will illustrate both options A and B referenced in the previous section.

Local-Storm PMP for McCoy Wash

Step

1. One-hour, 1-mi^2 PMP

   The centroid of the Wash is near latitude 33.75° N and longitude 114.75° W. Interpolation to this centroid on Figure 13.21 gives an average local PMP value (1-hour, 1-mi^2) of 11.4 inches to the nearest tenth of an inch. Interpolation was appropriate here since there is little, if any, gradient of index values across the Wash. For locations where significant gradients of index values exist, an average index value should be found.

2. Adjustment for Mean Drainage Elevation

   The mean elevation of the Wash is well below 6,000 feet as shown on Figure 13.29. No elevation adjustment is needed, and the local-storm PMP from Step 1 remains at 11.4 inches.

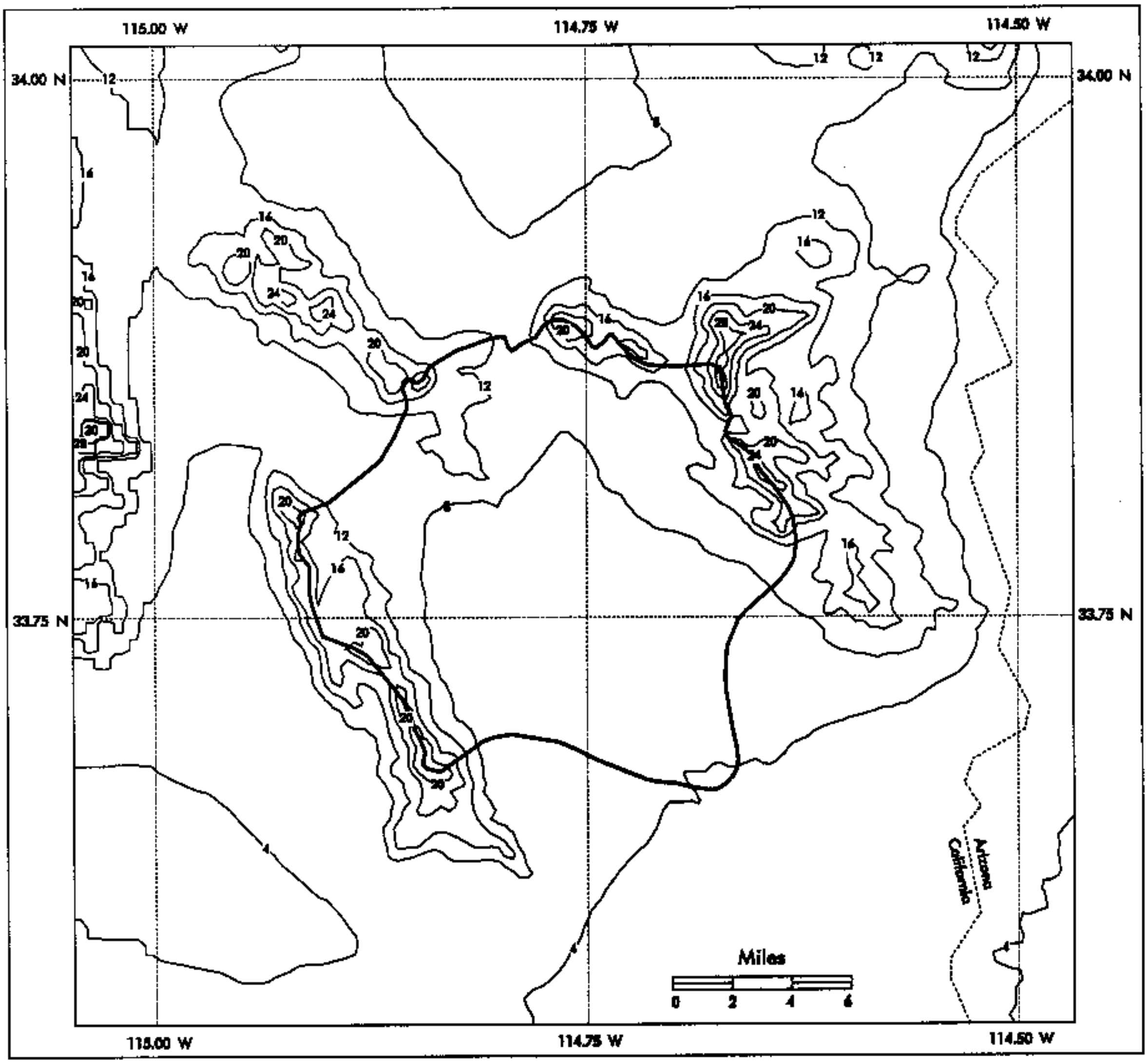

Figure 13.29. *McCoy Wash, California drainage boundary (solid, heavy line) with elevation contours (solid, thin lines) in hundreds of feet.*

3. Adjustment for Duration

The value of the 6-hour to 1-hour ratio near the Wash's centroid found in Figure 13.24 is 1.3. The depth-duration curve which applies here is curve *C* from Figure 13.23, and column *C* from Table 13.10 is also applicable.

Multiplication of the column *C* percentages by the average depth from Step 2 gives the average 1-mi^2 values for the Wash:

	Duration (hours)								
	1/4	1/2	3/4	1	2	3	4	5	6
1-mi^2 Average Depth (inches)	6.3	9.0	10.4	11.4	13.0	13.7	14.3	14.6	14.8

4. Adjustment for Basin Area

Figure 13.27 gives the depth-area relations for a 6-hour to 1-hour ratio of 1.3 The reduction ratios used to obtain average depths basin from 1-mi^2 depths for the 167 mi^2 and their depths are:

	Duration (hours)				
	1/4	1/2	1	3	6
Reduction Ratio	.31	.37	.43	.50	.54
167-mi^2 Average Depth (inch)	2.0	3.3	4.9	6.9	8.0

These results are shown, and a smooth curve fitted to these depths as shown in Figure 13.30.

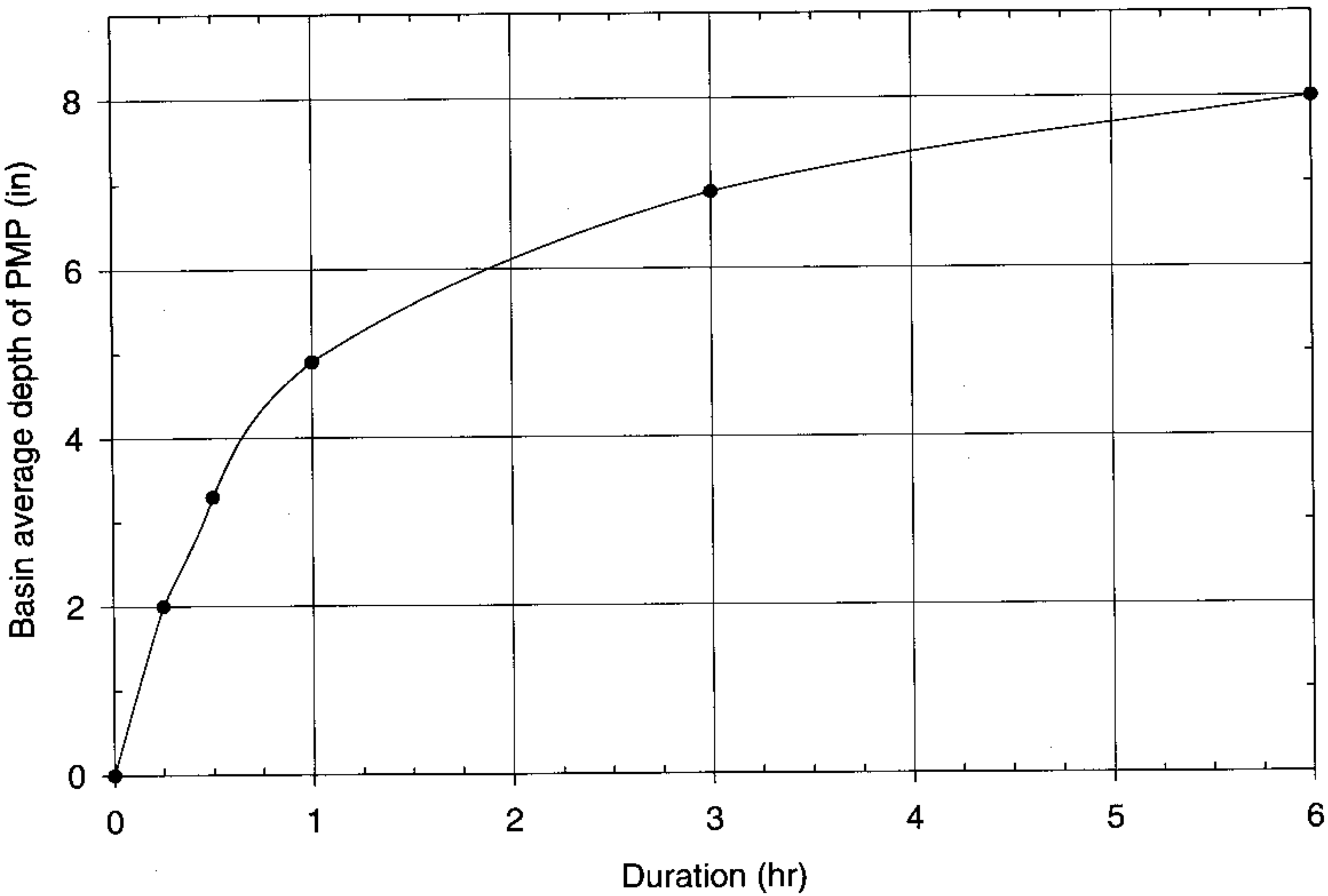

Figure 13.30. *Average depth of local-storm PMP for the 167-mi² McCoy Wash, California.*

5. Temporal Distribution

The smoothed cumulative hourly values from Step 4 and the incremental hourly values resulting from successive subtractions are:

Hourly Intervals						
	1	2	3	4	5	6
Cumulative PMP (inch)	4.9	6.1	6.9	7.4	7.7	8.0
Incremental PMP (inch)	4.9	1.2	0.8	0.5	0.3	0.3

The highest increment to lowest increment sequence shown above is the recommended chronology for local-storm PMP at McCoy Wash.

6. Areal Distribution of Local-Storm PMP

The areal distribution of local-storm PMP is given by the isohyets of Figure 13.20. Remember these isohyets are meant to be placed within a basin boundary at the 1:500,000 map scale. For this example, the percentages from Table 13.13 apply for a basin with a 6-hour to 1-hour ratio of 1.3. When the 6-hour to 1-hour ratio is 1.15, 1.2, or 1.4, Tables 13.11, 13.12, or 13.14 apply respectively.

It is important to note that when Tables 13.11 to 13.14 are used in a particular case, that the percentages from the selected table apply only to the 1-mi^2, 1-hour average local-storm PMP from Step 2, and NOT to the values from Step 3. In this example, the average depth is 11.4 inches, and the isohyetal labels of Table 13.15 result. An average 6-hour depth of 8.0 inches for the 167-mi^2 McCoy Wash Basin is given (Step 4). Using Figure 13.20 the isohyetal labels range from 14.82 inches enclosing 1 mi^2 to 4.33 inches enclosing 220 mi^2 for that duration.

Remember that the isohyetal labels in Step 6 produce the average depths from Step 4 only if the basin in consideration is elliptical with a 2:1 ratio of the major to minor axis and the ellipses are centered in a *perfect* drainage. The ellipses with the indicated values from this step when placed in an irregularly shaped drainage and then averaged, will produce average depths less than those resulting from Step 4. The PMP level for the drainage comes from Step 4, with the isohyetal labels of Step 6 giving an idea of a possible areal distribution for the storm.

Table 13.15. *Isohyetal label values for local-storm PMP, McCoy Wash, California (167 mi²).*

Isohyetal Tag (mi^2)	Duration (hours) 1/4	1/2	3/4	1	2	3	4	5	6
A (1)	6.27	9.01	10.37	11.40	13.00	13.68	14.25	14.59	14.82
B (5)	5.02	7.52	8.85	9.80	11.40	12.08	12.65	13.00	13.22
C (25)	2.96	5.02	6.11	9.65	8.44	9.23	9.80	10.15	10.37
D (55)	1.94	3.53	4.58	5.30	6.61	7.41	7.98	8.32	8.55
E (95)	1.25	2.28	3.06	3.71	4.79	5.59	6.16	6.50	6.72
F (150)	.75	1.48	2.17	2.74	3.65	4.33	4.90	5.24	5.47
G (220)	.74	1.25	1.60	1.82	2.62	3.19	3.76	4.10	4.33
H (300)	.57	.91	1.20	1.37	2.00	2.45	2.91	3.31	3.53
I (385)	.34	.68	.97	1.20	1.82	2.28	2.74	3.14	3.42
J (500)	.29	.63	.91	1.14	1.71	2.17	2.62	3.02	3.31

Endnote[1]

Plates 1 and 2 have limited detail in some regions. The Hydrometeorological Design Studies Center will provide supplemental map(s) containing a more complete set of isohyets or digital values for specific drainages areas, upon request.

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